

AMENDMENTS TO THE CLAIMS

A listing of the claims presented in this patent application appears below. This listing replaces all prior versions and listing of claims in this patent application.

1. (Currently Amended) A driving controller for controlling driving of a plurality of driving units physically connected with one another, at least a particular one of which includes a driving member frictionally engaged with a driven member, comprising:

a driving circuit which supplies a driving signal to the plurality of driving units;

a detecting circuit which detects whether the position of the driven member is changed at a predetermined time; and

a controlling circuit which is responsive to the detecting circuit, and controls the driving circuit to drive the particular driving unit including the driving member, and another driving unit at a predetermined timing when the detecting circuit detects the position of the driven member is not changed at the predetermined time, though the driving circuit provides a driving signal to the driving unit.

2. (Original) The driving controller according to claim 1, wherein the controlling circuit controls the driving circuit to drive the particular driving unit having the driving member and another driving unit at the same time.

3. (Original) The driving controller according to claim 2, wherein the particular driving unit including the driving member is arranged at a position to receive a vibration generated by the another driving unit.

4. (Previously Amended) The driving controller according to claim 2, wherein the particular driving unit including the driving member and the another driving unit are mounted on a common member.

5. (Original) The driving controller according to claim 2, wherein a driving axis of the particular driving unit including the driving member perpendicularly intersects a driving axis of the another driving unit.

6. (Original) The driving controller according to claim 1, wherein the controlling circuit controls the driving circuit to drive the particular driving unit having the driving member and another driving unit one after another.

7. (Original) The driving controller according to claim 6, wherein the particular driving unit including the driving member is arranged at a position to receive a vibration generated by the another driving unit.

8. (Original) The driving controller according to claim 6, wherein the particular driving unit including the driving member and the another driving unit are mounted on the common member.

9. (Original) The driving controller according to claim 1, wherein a driving axis of the particular driving unit including the driving member perpendicularly intersects a driving axis of the another driving unit.

10. (Original) The driving controller according to claim 1, wherein the driving unit includes an electromechanical conversion element which elongates and shrinks in response to the driving signal from the driving circuit, the driving member is connected with the electromechanical conversion element.

11. (Original) The driving controller according to claim 1, wherein the controlling circuit controls the driving circuit to increase the driving force of the particular driving unit having the driving member and the another driving unit in a stepwise manner.

12. (Original) The driving controller according to claim 1, wherein the detecting circuit detects whether a driven member to be driven by the driving member of the another driving unit is being driven in addition to detection as to whether the driven member to be driven by the driving member of the particular driving unit, and the controlling circuit controls the driving circuit to drive a driving unit corresponding to a driven member which is detected not to be driven by the detecting circuit.

13. (Currently Amended) An image sensing apparatus comprising:
an image sensing device which includes a number of pixels arrayed two-dimensionally, and senses a light image from an object to generate an electrical image signal;
an optical system which focuses the light image on the image sensing device;
a plurality of driving units at least particular one of which includes a driving member frictionally engaged with a driven member mechanically connected with at least one of the image sensing device and the optical system;
a driving circuit which supplies a driving force to the plurality of driving units;
a detecting circuit which detects whether the position of the driven member is changed at a predetermined time; and
a controlling circuit which is responsive to the detecting circuit, and controls the driving circuit to drive the particular driving unit including the driving member, and another driving unit at a predetermined timing when the detecting circuit detects the position of the driven member is not changed at the predetermined time, though the driving circuit provides a driving signal to the driving unit.

14. (Original) The image sensing apparatus according to claim 13, wherein the particular driving unit including the driving member is adapted for moving the image sensing device in a first direction, and the another driving unit is adapted for moving the image sensing device in a second direction perpendicularly intersecting the first direction.

15. (Original) The image sensing apparatus according to claim 14, wherein a driving axis of the particular driving unit including the driving member perpendicularly intersects a driving axis of the another driving unit.

16. (Original) The image sensing apparatus according to claim 13, wherein the particular driving unit including the driving member is adapted for moving the optical-system along an optical-axis direction.

17. (Original) The image sensing apparatus according to claim 16, wherein the another driving unit includes a vibrator for vibrating the apparatus.

18. (Currently Amended) A method for controlling driving of a plurality of driving units physically connected with one another, at least a particular one of which includes a driving member frictionally engaged with a driven member, comprising the steps of:

detecting whether the ~~detects whether the~~ position of the driven member is changed at a predetermined time; and

driving the particular driving unit including the driving member, and another driving unit at a predetermined timing when the detecting circuit detects the position of the driven member is not changed at the predetermined time, though the driving circuit provides a driving signal to the driving unit.

19. (Original) The method according to claim 18, wherein the particular driving unit having the driving member and the another driving unit are driven at the same time.

20. (Original) The method according to claim 18, wherein the particular driving unit having the driving member and the another driving unit are driven one after another.

21. (New) A driving controller for controlling driving of a plurality of driving units physically connected with one another, at least a particular one of which includes a driving member frictionally engaged with a driven member, comprising:

a driving circuit which supplies a driving signal to the plurality of driving units;

a detecting circuit which detects whether the position of the driven member is changed at a predetermined time; and

a controlling circuit which is responsive to the detecting circuit, and controls the driving circuit to drive the particular driving unit including the driving member, and another driving unit to release an adhered state when the frictionally engaged portion of the driving member and the driven member is adhered.